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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,008	07/23/2003	Kang Yang	QUANT1400 (028248-3501)	9908
30542	7590	06/24/2005	EXAMINER	
FOLEY & LARDNER P.O. BOX 80278 SAN DIEGO, CA 92138-0278			KOPEC, MARK T	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/626,008

Applicant(s)

YANG ET AL.

Examiner

Mark Kopec

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-38 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 14, 18 and 22 of copending Application No. 10/342,143. Although the conflicting claims are not identical, they are not patentably distinct from each other

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because both the instant claims and the above listed claims of S.N. 10/342,143 are drawn to electrically conductive compositions containing a maleimide compound and a free-radical initiator. The co-pending compositions, in the form of a liquid, meet the instant requirement "A conductive ink...".

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for

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establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-38 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dershem et al (6,034,195).

Dershem et al (6,034,195) discloses thermosetting resin compositions which do not require solvent to provide a system having suitable viscosity for convenient handling. Invention

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compositions have the benefit of undergoing rapid cure. The resulting thermosets are stable to elevated temperatures, are highly flexible, have low moisture uptake and are consequently useful in a variety of applications, e.g., in adhesive applications since they display good adhesion to both the substrate and the device attached thereto (Abstract). The compositions comprise a maleimide/diluent resin disclosed at Col 3, line 1, to Col 4, line 5. The compositions also contain free-radical initiator (Col 8, lines 33-60), and electrically conductive filler (Col 9, lines 60-65; examples 11-12). The materials are applied to substrate in paste form (Col 10, lines 45-48; examples 11-12). Additionally, the examiner construes the "die attach" teaching of the reference to meet each of the claimed process limitations regarding instant claims 32-38. During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541,

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550-51 (CCPA 1969). The reference specifically or inherently meets each of the claimed limitations.

The reference is anticipatory.

In the event that any minor modifications are necessary to meet the claimed limitations, such as selection of a particular known adjunct or comonomer, such modifications are well within the purview of the skilled artisan.

Claims 1-38 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ikeguchi et al (4,552,690) or Cassat (4,756,756).

Ikeguchi et al (4,552,690) discloses an electrically conductive resin composition comprising 15-35 parts by weight of a cyanate ester compound and 65-85 parts by weight of an electrically conductive powder selected from the group consisting of a copper powder, a copper alloy powder and a silver powder and mixtures thereof, the cyanate ester component content in the cyanate ester compound being more than 50% by weight in terms of monomer, characterized in that the composition contains 0.5-15 parts by weight of acetylacetone or its derivatives is disclosed. The electrically conductive resin composition is useful as a conductive ink (Abstract). Preferred ester compounds include cyanate-maleimide/epoxy resin (Col 2, lines 3-13), and a variety

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of additives may be added to the resin composition in order to obtain suitable viscosity of the composition or to improve adhesion, curing characteristics and flexibility of the composition. Examples of such additives include thermosetting resins, such as polyester resin, phenol resin, acrylic resin, urethane resin and the like; thermoplastic resins, such as thermoplastic urethane resin, polyvinyl acetate resin and the like; rubbers, such as polybutadiene, butadiene-acrylonitrile copolymer, polychloroprene, butadiene-styrene copolymer, polyisoprene, butyl rubber, natural rubbers and the like; natural or synthetic inorganic materials, such as silica, mica, zinc oxide, titanium oxide and the like; organic solvents, such as acetone, methyl ethyl ketone, N,N-dimethyl formamide, butylcarbitol acetate and the like; organic acids; inorganic acids; coupling agents; flame retardants; self-extinguishing agents and well known additives. The curable composition of this invention may be reticulated by heating it alone to form a cured resin having heat resistance. In general, a catalyst may be used in order to promote crosslinking reaction of the components in the composition (Col 4, lines 10-33). See also examples 1-7 (Col 5-6). The reference specifically or inherently meets each of the claimed limitations.

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The reference is anticipatory.

In the event that any minor modifications are necessary to meet the claimed limitations, such as selection of a particular comonomer or minor variation in percentages, such modifications are well within the purview of the skilled artisan.

Cassat discloses thick-layer hybrid electronic printed circuits are formed by printing predetermined circuit pattern onto an insulating substrate by deposition of predetermined ink pattern thereupon, advantageously by silk-screening or masking, and thence baking said ink circuit pattern, and repeating the deposition/baking steps as required, the subject forming process featuring use of an insulating ink comprising a non-conductive metallic oxide extender, desirably cuprous oxide, which ink is thus either potentially conductive or potentially resistive, and the development of such conductivity or resistivity, after baking, by treating the ink pattern with a reducing agent, desirably a borohydride, as to readily and quantitatively convert said metal oxide into a conducting metal (Abstract). Even more particularly, the present invention relates to a process for the manufacture of hybrid circuits in which the metal extender of the ink preferably comprises cuprous oxide, and in which the reducing agent preferably comprises a borohydride (Col 4, lines 64-68).

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The resin used is generally in the form of a thermosetting prepolymer (having a softening point and still being soluble in certain solvents) at the time of preparation of the ink, and it is in the completely cross-linked form (infusible and totally insoluble) in the ink such as obtained after baking. The resin in the form of a prepolymer, used initially, can advantageously contain a hardening catalyst. Preferably, the binder consists of a resin of the polyimide type, obtained by reaction of an unsaturated dicarboxylic acid N,N'-bis-imide with a primary polyamine, according to, for example, French Pat. No. 1,555,564, U.S. Pat. Nos. 3,562,223 and 3,658,764 and U.S. Pat. No. Re. 29,316; hereby expressly incorporated by reference. The polyimide resin can also be obtained by reaction of the bis-imide with the polyamine and various adjuvants, such as, for example, mono-imides (according to French Pat. No. 2,046,498), monomers, other than imides, containing one or more polymerizable groups of the type CH₂ (according to French Pat. No. 2,094,607), unsaturated polyesters (according to French Pat. No. 2,102,878) or hydroxylic organosilicon compounds (according to French Pat. No. 2,422,696); these also hereby being expressly incorporated by reference. In the case where such adjuvants are used, it will be appreciated that the polyimide resin in the form of a prepolymer can be: the reaction product of a bis-imide and a polyamine with

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an adjuvant, or the reaction product of a bis-imide prepolymer and a polyamine with an adjuvant, or alternatively a mixture of a bis-imide prepolymer and a polyamine with an adjuvant (Col 5, line 50 to Col 6, line 13). The polyimide resin in the form of a prepolymer, used initially, can advantageously contain small amounts of a free-radical polymerization initiator, such as, for example, dicumyl peroxide, lauroyl peroxide or azobisisobutyronitrile, or of an anionic polymerization catalyst, such as, for example, diazobicyclooctane. In the present invention, it is even more preferred to use a polyimide resin resulting from the reaction of a bis-maleimide, such as N,N'-4,4'-diphenylmethane-bis-maleimide, with a primary diamine, such as 4,4'-diaminodiphenylmethane, and, if appropriate, one of the various adjuvants mentioned above (Col 6, lines 15-25). See also example 1. The reference specifically or inherently meets each of the claimed limitations.

The reference is anticipatory.

In the event that any minor modifications are necessary to meet the claimed limitations, such as selection of a particular comonomer or minor variation in percentages, such modifications are well within the purview of the skilled artisan.

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In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

The remaining references listed on forms 892 and 1449 have been reviewed by the examiner and are considered to be cumulative to or less material than the prior art references relied upon in the rejection above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Kopec whose telephone number is (571) 272-1319. The examiner can normally be reached on Monday - Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mark Kopec
Primary Examiner
Art Unit 1751

MK

June 22, 2005